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Natural Catastrophe Stress Test Methodology

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Catastrophe Risk Management Incorporated Within the Rating Analysis

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This methodology is available at
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A.M. Best continues to view catastrophe exposure as the No. 1 threat to the financial strength and credit quality of property and casualty insurers because of the significant, rapid and unexpected impact that can occur. While other exposures historically have affected solvency, no single exposure has impacted policyholder security more instantaneously than catastrophes.

The purpose of this paper is to reiterate A.M. Best's approach regarding natural catastrophe analysis and the impact on A.M. Best's rating assignments. In addition, the paper is intended to highlight some recent revisions regarding the methodology and application of the "Natural Catastrophe Stress Test" (stress test). These revisions were developed based on analysis regarding reinsurance recoverable payment patterns related to several natural catastrophe events in recent years. In addition, A.M. Best has observed improvement in companies' natural catastrophe risk management. Accordingly, it is appropriate to modify the stress test to allow for greater differentiation in applying the natural catastrophe stress test for risk-adjusted capital requirements, with respect to the assessment of an organization's catastrophe risk management practices and overall data quality.

Quantitatively, the revision in the stress test will allow for greater leeway in the level of capital requirements. However, a greater emphasis on a company's overall catastrophe management process, and particularly on the quality of data used, may result in little change to a company's level of required capital. Ultimately, the quality of each organization's catastrophe management process and the integrity of data used in formulating the view of risk will determine the level of benefit a company realizes from this modification to criteria.

As detailed in *Understanding BCAR for Property/Casualty Insurers*, published Jan. 20, 2009, A.M. Best's main tool for evaluating a company's operating capitalization is Best's Capital Adequacy Ratio (BCAR). The BCAR model provides a risk-adjusted view of capitalization by assuming a reasonably severe event (defined as the greater of a 100-year wind or 250-year earthquake per occurrence probable maximum loss or recent actual large loss). However, to truly understand a company's financial position after an actual event, A.M. Best conducts additional analyses, including the "Natural Catastrophe Stress Test," which considers the balance sheet risks from increased reinsurance recoverables and reserves associated with a natural catastrophe. Assuming an event actually has occurred, including the resulting financial effects, allows A.M. Best to formulate a more accurate view of the company's balance sheet strength following an event. Although risk mitigation efforts after a significant event can be implemented, the results are not immediate and may require a full renewal cycle or more to execute, as was demonstrated over the past several years. Accordingly, to reflect the notion that the company's net exposure is similar after an event and that the organization remains exposed to additional events, a second net after-tax retention is included. This should not be interpreted as A.M. Best requiring a company to withstand two major events but instead is intended to be a reasonable reflection of the stressed risk profile shortly after a catastrophic loss.

As the stress test reflects the financial condition following an event, A.M. Best may allow the stress-tested score to fall below the minimum required capital levels. This tolerance is intended to reflect the expectation that improvement will occur as reinsurance recoverables and reserves are reduced and, in some cases, capital restored. As discussed later, the level of deterioration allowed from a standard risk-adjusted capital level to a stress-tested level will be determined based on a number of quantitative and qualitative factors.

Stress Test Methodology

With regard to the calculations in the BCAR model in the case of the stress test, the following procedures are followed:

- The after-tax net per occurrence PML (probable maximum loss) of the first event, including retention, co-participation and reinstatement premiums on catastrophe reinsurance contracts, is subtracted from surplus.

- Reinsurance recoverables are increased by 40%** (previously 80%) of the difference between the gross and net pretax PML (retention and co-participation) of the first event.

- The potential for a one-level downgrade of the reinsurers on the catastrophe program no longer is reflected.

- 40%** (previously 80%) of the pretax net PML (retention and co-participation) of this first event is added to existing reserves to capture the potential for adverse development. Companies protected from any adverse development would not require this adjustment.

- The after-tax net PML (retention, co-participation and reinstatements) for an additional event is deducted from risk-adjusted surplus.

It is important to note that the probable maximum loss estimates provided by the company may be adjusted upward by A.M. Best if they are missing certain coverages; are based on poor quality data or outdated exposure information; or are calculated without using certain conservative assumptions such as storm surge, demand surge or loss-adjustment expense.

**Assumed recoverable/reserve load can be as low as 40%; it may be adjusted upward based on structure and quality of the reinsurance program as well as A.M. Best's view of the quality of the company's catastrophe management program.

The PML used for the second event is the same as for the first event where hurricanes/windstorms are the major risk, as the occurrence of a major hurricane/windstorm has no influence on the potential severity of subsequent events. Where earthquakes are the major exposure, the second event is reduced to a 1-in-100 year event, given the extremely low probability of a second major earthquake following the first event in the same year.

Capital Adequacy Levels

A.M. Best's published minimum BCAR guidelines for financial strength ratings are shown in **Exhibit 1**. To be considered for a particular rating level, an insurer's standard (non stress-tested) BCAR must meet or exceed the minimum requirement for that rating level. However, if an entity has volatile operating history, a weak business profile or poor risk management, the standard BCAR must be maintained substantially higher than the indicated guidelines for the given rating level.

Since the stress test is intended to represent a company's financial position shortly after an event, and in theory risk-adjusted capitalization should recover over the intermediate term, the stress-tested BCAR score can fall to a maximum of 30 points below the minimum. As indicated above, determination of each entity's minimum stress-tested BCAR score will vary based on a number of

Exhibit 1

Minimum BCAR Guidelines

Implied Balance Sheet Strength	Minimum BCAR
Secure	
A++	175
A+	160
A	145
A-	130
B++	115
B+	100
Vulnerable	
B	90
B-	80
C++	70
C+	60
C	50
C-	40
D	0

Note: Requirements for new company formations are generally higher given the limited track record of performance and corresponding uncertainty (See methodology *Rating New Company Formations*, March, 2004) attributes, including operating performance, business profile and risk management capabilities, and in some cases may be higher than the minimum capital requirements for the targeted rating level. The level of tolerance relative to the specific minimum will be based on A.M. Best's assessment of a number of factors.

Key among the factors regarding A.M. Best's tolerance is the organization's perceived financial flexibility. Companies that are able and willing to replace lost capital immediately following an event will be afforded greater leeway with regard to the disparity in the standard BCAR and the natural catastrophe stress test. The source and type of funds available will play an important part in this determination. The capital markets' willingness to provide the necessary funding also will be considered and will vary depending on market conditions. An assessment of financial flexibility also will include parent and subsidiary relationships and will incorporate A.M. Best's expectation of the level of commitment to the catastrophe-exposed subsidiary on both a current and a prospective basis (see methodology *Rating Members of Insurance Groups*).

In the event that debt is issued to facilitate the replenishment of capital, the holding company analysis will be updated to assess the impact on financial leverage and coverage ratios.

A second key factor regarding the level of decline in the stress-tested scenario will be an assessment of historical volatility in terms of both the balance sheet and operating performance. Companies with significant volatility in results will be afforded less tolerance in A.M. Best's view, as replenishing capital through earnings could prove difficult. Conversely, companies with consistently stable results and proven track records of favorable earnings and corresponding growth in surplus will be afforded greater tolerance in the stress-test scenario.

Another important consideration will be a company's exposure to multiple events in a season. As was evident over the past several years, this exposure to frequency applies to both hurricane- and tornado/hail-exposed regions. Those with exposure to more frequent severe events will be afforded less tolerance in the application of the stress test. An accumulation of losses associated with multiple events is an important consideration, particularly as it applies to net retention levels relative to surplus. A high frequency of events combined with even a modest net retention potentially could generate a significant accumulation of losses. Accordingly, the ability to absorb

Exhibit 2
Hypothetical Company Comparison

	Company A	Company B	Company C	Company D
Profile	Personal Auto/Homeowners in several Midwestern States	Personal/Commercial Auto, Homeowners & Small Commercial in Western U.S.	Start-up Primary Property along Gulf Coast	Start-up Commercial & Primary Property in Southeast U.S.
Standard BCAR	170	145	180	300
Stressed BCAR	135	104	130	185
Financial Flexibility	Limited	Strong	Average	Average
Historical Volatility (Balance Sheet & Op. Performance)	Yes	No	Not Applicable	Not Applicable
Frequency Exposure	Yes	No	Yes	Yes
Primary Cat Exposure	Tornado	Earthquake	Hurricane	Hurricane
Catastrophe Exposure to Surplus	Modest Gross & Net Exposure	High Gross, Low Net	High Gross, Modest Net	High Gross, Low Net
Catastrophe Risk Management Capabilities	Average (somewhat concentrated) Annual catastrophe model runs Minimal data verification	Above Average (geographic spread, diversification by line) Models and aggregate exposure used in underwriting process Data verification process used	Average but untested (concentrated exposures but adequate reinsurance program)	Average but untested (concentrated exposures, adequate reinsurance program, management history in region & lines of business)
Maximum Allowance in Stress Test (Below Minimum)	0 points	30 points	N/A – margin required until catastrophe management process in place	N/A – margin required until catastrophe management process in place
Resulting FSR	A- Stable	A- Stable	B++ Stable	A- Stable

subsequent events could become a rating issue, leading to less tolerance relative to the minimum capital requirements.

A.M. Best also will consider the overall level of catastrophe exposure relative to surplus as part of the stress-test application. Those companies that have relatively high catastrophe exposure, either gross or net of reinsurance, likely will have higher capital requirements, given the inherent risks associated with elevated dependence on reinsurance and greater exposure to credit risk.

Underlying all these factors is A.M. Best's assessment of each company's catastrophe risk management capabilities. A.M. Best believes companies that possess strong catastrophe risk management focus on data quality, continually monitor exposures and have specific controls in place to manage their exposure on an ongoing basis (see methodology, *Catastrophe Risk Management Incorporated Within the Rating Analysis*).

Accordingly, companies that have these characteristics likely will mitigate the overall loss associated with severe events and avoid material declines in risk-adjusted capitalization.

As indicated, the level of tolerance regarding the decline in the stress test will be based on a qualitative assessment of these factors and will be determined via the rating committee process, as there is no one BCAR score that equates to a given rating level for all companies. While the stressed scenario for some companies may fall below the minimum, for others this evaluation may result in no allowance relative to the minimums. Once again, the interplay of risk-adjusted capitalization, operating performance and business profile ultimately determines the rating.

Conclusion

A.M. Best continues to believe that understanding each rated entity's financial condition after a natural catastrophe, as

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well as its ongoing ability to respond to subsequent events, is a critical component of the rating assignment. In addition, each company's catastrophe management capabilities and level of data quality play an extremely important role in the assessment of capital required to offset catastrophe risk. Accordingly, A.M. Best will continue to put significant emphasis on catastrophe management, using both the standard and stress-tested views of risk-adjusted capitalization.

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